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In the UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Gebhard Dopper

Application No. 10/085,527

Filed: February 28, 2002

Title: METHOD AND DEVICE FOR TREATING THE SURFACE OF A PART

Examiner: Katherine A. Bareford Art Unit: 1762

➨ **FACSIMILE ATTN TO: KATHERINE A. BAREFORD FAX NO.: 703-872-9306**

APPELLANT'S BRIEF

Commissioner for Patents
Alexandria, VA 22314

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Filing Date	FEBRUARY 28, 2002
First Named Inventor	GEBHARD DOPPER
Art Unit	1762
Examiner Name	KATHERINE A. BAREFORD
Attorney Docket Number	99P03591WOUS

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SIEMENS

PATENT

Attorney Docket No. 99P03591WOUS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:

Inventor:	G. Dopper	Group Art Unit:	1762
Serial No.:	10/085,527	Examiner:	K. Bareford
Filed:	February 28, 2002		

Title: METHOD AND DEVICE FOR TREATING THE SURFACE OF A PART

APPELLANT'S BRIEF

Commissioner For Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This Appeal Brief relates to an appeal from the final rejection of claims 1-10, 12, 13, and 18-25 in the Office Action dated June 15, 2004. It is also responsive to the Notification of Non-Compliant Appeal Brief mailed March 21, 2005.

Real Party in Interest

This application is assigned to Siemens Aktiengesellschaft of Munich, Germany.

Related Appeals and Interferences

No related appeals or interference proceedings are currently pending that would directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

Status of Claims

Claims 1-10, 12, 13, and 18-25 are rejected and are under appeal. Claims 11, and 14-17 are canceled.

Status of Amendments

An amendment after final under 37 CFR § 1.116 was proposed on August 8, 2004. The Examiner stated in an Advisory Action mailed September 1, 2004 that the amendment was not entered or considered.

Summary of Claimed Subject Matter

Referring to Figure 1, Applicants invention claims a method for surface preparation of a metal component having a curved surface, see, e.g., spec, page 4 lines 18-19. A plurality of spray jet parameters (blasting distance, blasting intensity, blasting angle, and blasting time) are controlled via a control system (see Figure 8) to remove material from the metal component surface, see, e.g., spec, page 4 lines 23-31, in order to prepare or roughen the surface to receive a ceramic coating (see Figure 4), while maintaining at least one of the jet spray parameters constant, thereby producing a uniform surface roughness on the blasted curved metal surface, see, e.g., spec, page 4 lines 31-35.

A concise explanation of the subject matter defined in each independent claim involved in this appeal is provided as follows:

In Claim 1, the invention claims measuring a contour line geometry of the curved surface, see, e.g., spec, page 15 lines 5-14; inputting the measured geometry into a control system, see, e.g., spec, page 15 lines 5-14; and controlling the plurality of spray jet parameters via the control system based on the geometry, see, e.g., spec, page 15 lines 7-14.

In Claim 18, the invention claims converting the measured geometry into input data, see, e.g., spec, page 15 lines 9-11 and inputting the data into the control system configured to control a plurality of spray parameters based on the data, see, e.g., spec, page 15 lines 9-14.

Grounds for Rejection to be Reviewed

1. Whether claims 1-10, 12, 13, and 18-25 and are obvious under 35 U.S.C. §103 as being unpatentable over Taylor et al. (US 5,520516 "Taylor") in view of McComas et al. (US Re 35,611 "McComas"), and in further view of Kaiba et al. (US 6,096,132 "Kaiba").

2. Whether claims 1-10, 12, and13 fail to comply with the written description requirement under 35 U.S.C §112, first paragraph.

Appellant's Argument

1. Claims 1-10, 12, 13, and 18-25 stand rejected under 35 U.S.C. § 103(a), the Examiner contending that these claims are obvious over Taylor in view of McComas, and in further view of Kaiba. The Applicant respectfully disagrees with Examiner's position that the claimed invention is unpatentable over the Examiner's proposed combination, maintaining that the Examiner's proposed combination is inappropriate and that even if appropriate such a combination does not teach or suggest the claimed invention.

Taylor is a coating process for applying a ceramic oxide to a beveled blade tip that results in a coating having microcracks that improve thermal cycling tolerance. Taylor does discusses grit blasting can be used to roughen the surface of the metal blade tip in order to improve the coating bond strength of the later applied ceramic oxide coating. Importantly, although Taylor uses a specified blast pressure and fluid composition, Taylor lacks, as pointed out by Examiner, "a teaching of measuring a contour line geometry of the blade tip and controlling a plurality of spray parameters in such a way that a homogeneous surface roughness is established along the contour line" as claimed. The Examiner maintains that an engineer having ordinary skill in the art would have recognized that each of the blasting distance, intensity, angle, and time would affect the amount and degree of roughness produced but Examiner fails to explain why such engineer would have been motivated to measure the contour line geometry, control the spray parameters while keeping one parameter constant and seek uniform roughening.

The Examiner alternatively rejects Applicant's claims by combining Taylor in view of McComas and Kaiba. As explained below, this combination properly fails.

McComas, unlike Taylor, is a ceramic removal process that utilizes liquid jet blasting to remove a coating from a surface. As noted in column 3, lines 51-56, the McComas parameters of blasting pressure, blasting angle, and blasting time are established as not to cause damage to the underlying metal substrate surface – which is inapposite, if not contradictory, with Taylor's surface roughening. Additionally, McComas discloses that blasting time is dependent upon the total surface area of the metal surface, not the desired surface roughness – which is inapposite, if not contradictory, with Taylor's surface roughness. Such a combination will not properly produce a surface having a uniform roughness as claimed by Applicant.

Kaiba is an automobile paint sprayer having fixed spray heads that travel in the X, Y and Z directions relative to a stationary automobile whereas Applicant's claimed invention teaches surface roughening of a metal component using a grit blasting device having motion in the X and Y directions and a blast head capable of rotating in the X-Y plane relative to a metal component. Because of the fixed blasting angle, Kaiba cannot allow control of the spray head to ensure a blasting angle along a curved surface, and particularly in the range of 20 to 90 degrees (see claim 13).

The Applicant maintains that the Examiner has not established a *prima facie* case as to why one of ordinary skill in the art would have been led to combine Taylor, McComas, and Kaiba. As explained by the Federal Circuit:

> Virtually all inventions are combinations of old elements. Therefore an examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be an illogical and inappropriate process by which to determine patentability. (emphasis added).
>
> *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1457 (Fed. Cir. 1998).

Just because the prior art may be modified in some manner suggested by the PTO Examiner, does not make the modification obvious, unless the prior art teaches or suggests the

desirability of the modification. See *In re Fitch*, 972 F.2d 1260 (Fed. Cir. 1992). In the present case, the Examiner offers no proper motivation from the prior art that would lead one of ordinary skill in this field to make the proposed combination. Instead, the Examiner merely asserts that a person of ordinary skill in this art would modify Taylor with the features of McComas and Kaiba to produce Applicant's claimed invention. In this manner, the Examiner has, as was proscribed by the Rouffet Court, relied upon the Applicant's invention to provide a blueprint for finding the elements to defeat the claimed invention.

The Applicant respectfully submits that no teaching to combine exists and that the Examiner's proposed combination is inappropriately motivated by hindsight use of the Applicant's invention and is therefore inappropriate. The Applicant hereby requests that the appropriateness of the Examiner's combination be reconsidered.

Even if combined, Taylor, McComas, and Kaiba would not provide the claimed invention. Instead, the combination would provide a method for roughening a component by grit blasting a surface at a blasting pressure and fluid content that are acceptable to roughen the surface, but with blasting angle, blasting intensity, and blasting time set to clean a treated surface with blasting time chosen without regard to surface finish but instead ensuring a clean surface and using a spray head able to translate along the X-Y-Z axes. This combination would not teach or suggest a method for the surface preparation of a metal component having a curved surface as is claimed in the present invention.

Based on the foregoing, Applicant respectfully submits that claims 1-10, 12, 13, and 18-25 are patentable. The honorable Board is therefore respectfully urged to reverse the final rejection of the Examiner and to remand the application to the Examiner with instructions to allow claims 1-10, 12, 13, and 18-25 under appeal.

2. Applicant amended claims 1-10, 12, and 13, as suggested by Examiner, to overcome the §112 rejection in the amendment after final (not entered by Examiner). Applicant respectfully requests the Board of Patent Appeals and Interferences to consider this rectifying amendment (replacing "the ceramic coating" with a jet spray, Claim 1, line 14 of page 2 of Applicant's Response to Office Communication dated April 1, 2004).

Please charge any fees that might be due with respect to this paper to the Deposit Account No. 19-2179. Please grant any extensions of time required to enter this paper.

Respectfully submitted,

Dated: 4/21/05

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Appendix - Appealed Claims:

1. A method for the surface preparation of a metal component having a curved surface to accept a ceramic coating, comprising:

measuring a contour line geometry of the curved surface;

inputting the measured geometry into a control system; and

controlling a plurality of spray parameters of the ceramic coating via the control system based on the geometry to direct a particle source toward the metal component, the spray parameters comprising: a blasting distance, a blasting intensity, a blasting angle and a blasting time such that at least one of the parameters remains constant during the surface preparation.

2. The method as claimed in claim 1, wherein at least one of the spray parameters automatically remains constant during the spraying operation by the control system.

3. The method as claimed in claim 1, wherein the the metal is a superalloy.

4. The method as claimed in claim 1, wherein the blasting distance of the particle source to the component remains constant.

5. The method as claimed in claim 1, wherein the particle source is moved relative to the metal component so that the blasting angle remains constant.

6. The method as claimed in claim 1, wherein the component has a base body with a base material, the base body having the component surface which, for a first coating to be applied to the base body, is treated with a first coating material.

7. The method as claimed in claim 6, wherein the first coating material used is an MCrAlX alloy, where M represents one or more elements comprising iron, cobalt and nickel, Cr represents chromium, Al represents aluminum and X represents one or more elements selected from the group consisting of yttrium, rhenium and the rare earths.

8. The method as claimed in claim 6, wherein the first coating also has the component surface which, for a second coating to be applied to the component, is treated with a second coating material.

9. The method as claimed in claim 1, wherein the component has a base body with a base material, a first coating comprising a first coating material being applied to the base body, and the coated component, for a second coating to be applied to the component, being treated with a second coating material.

10. The method as claimed in claim 8, wherein, in the coating process, a ceramic is used as the second coating material.

11. (canceled)

12. The method as claimed in claim 1, wherein the component used is a turbine rotor blade, a turbine guide vane or a heat shield element of a combustion chamber.

13. The method as claimed in claim 1, wherein the blasting angle on the component surface is approximately 20° to 90°.

14. (canceled)

15. (canceled)

16. (canceled)

17. (canceled)

18. A method for surface preparation of a metal component having a curved surface to accept a ceramic coating, comprising:

measuring a contour line geometry of the curved surface;

converting the measured geometry into input data; and

inputting the data into a control system, the control system configured to control a plurality of spray parameters based on the data and direct a particle source toward the metal component,

wherein at least one of the parameters remains constant during the surface treatment and the surface preparation results in the curved surface having a substantially uniform surface roughness.

19. The method as claimed in claim 18, wherein the particle source is moved relative to the component so that the blasting distance remains constant.

20. The method as claimed in claim 18, wherein the particle source is moved relative to the component in such a way that the blasting angle remains constant.

21. The method as claimed in claim 1, wherein the blasting distance is measured from the particle source to a point of impingement of a the spray on the metal component surface.

22. The method as claimed in claim 1, wherein the blasting angle is measured as an angle between a direction of the spray and a local normal to the metal component surface at a point of impingement.

23. The method as claimed in claim 1, wherein the blasting intensity is measured as a flow rate of the particle.

24. The method as claimed in claim 1, wherein the blasting time is measured as a residence time of the spray on a selected section of the contour line.